DISLOCATION OF THE SEVENTH CERVICAL VERTEBRA; CLINICAL HISTORY OF A CASE; REMARKS.*

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H. B., 37 years of age, single, farmer by profession, of unusually good physique (six feet tall, of proportionate weight), in perfect health, free from any suspicion of alcohol, lues or a cachexia of any kind.

The following account of the accident and of the clinical history prior to our own observation was obtained from the patient and his relatives (all well-educated, cultured persons).

June 16, 1900, he was sitting in a hammock, his feet hanging over one side; one of the suspending cords parted and he was thrown with great force so that he turned a complete back somersault, striking on his neck and shoulders. When reached by members of the family he was perfectly conscious but quite helpless, unable to move the lower portion of his body at all, and his arms only feebly. He was stunned by the fall but he did not think that he totally lost consciousness. He could not have been long on the ground for he had been seen in the house at 11.30 A.M., and was found in his injured condition a few minutes after 12 o'clock.

It was asserted by the patient and others that the portion of the hammock occupied by him at the time of the fall could not have been more than 25 to 30 inches from the ground. He could not explain how or why he turned a somersault in this short fall, but as evidence, cited the fact that after the fall he lay with his legs extended in an exactly opposite direction from the one they were in before he fell.

He was carried six miles in a wagon and 35 miles by the train to the city, and from the railroad station by ambulance to St. Luke's Hospital, reaching this destination at 7 P.M. Considering the patient's condition, this whole journey was accomplished with comparatively slight discomfort and fatigue.

When he reached the hospital his temperature was 99.4°, pulse 60, respiration 16, sensorium perfectly clear. He complained only of paresthesia and of slight pain in the back of his neck and shoulders and ulnar sides of both arms.

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I first saw the patient on the morning following the injury (July 17), in consultation with other physicians and surgeons. A serious accident to the cord at the seventh cervical segment was readily made out, the patient's condition corresponding exactly to the usual diagrammatic pictures of a shut-off lesion at this point, viz.: complete anesthesia of all portions of the body below the line of the 3rd rib and of the ulnar sides of the arms, a hyperesthetic area immediately above the anesthetic one, and complete paralysis of motion below this point, including the bladder and bowel. The reflexes, both superficial and deep, were absent. No plantar reflex could be obtained on the first examination. Two days later, however, the Babinski sign was faintly present.

On two occasions the neck was thoroughly and systematically examined in the presence of a number of physicians. Forcible traction was made, and with and without traction, the head was manipulated in all possible directions. During these movements the cervical and upper dorsal vertebræ were carefully palpated, but no sign of crepitation, increased mobility, or displacement of any of the vertebral processes could be discovered. The examinations did not cause much pain. When the traction or the movements became extreme he complained of a warm, tingling sensation which radiated through the neck and shoulders and down the ulnar sides of the arms to the fingers. Sometimes in moving him, *e.g.*, in lifting and turning his shoulders, this tingling paresthesia became exaggerated until it amounted to actual pain; and was sometimes accompanied by a "sinking feeling," as he expressed it.

He moved his arms quite freely. They were weak generally rather than in any particular segment. The inclination to abduct them and rest them on the pillows to the side was evident. The chin was thrown slightly forward, the head having the appearance of being retracted. There was no stiffness, however, to be detected in the cervical muscles.

He entered the hospital on the evening of the 16th and died on the 24th at one o'clock A.M. The following is a condensed record of the temperature, pulse and respiration during this time:

Date	Temperature		Pulse		Respiration	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
16th		99.4		60		16
16th		101		58		16
17th	102.	102.	70	85	20	34
18th	103.	102.	88	74	34	24
19th	101.	101.	70	60	24	20

20th	100.6	100.	58	58	20	20
21st	99.4	100.4	58	60	20	20
22nd	100.4	101.2	62	70	20	20
23rd	101.	102.4	60	72	20	20

The clinical record contains little of moment beyond what has already been mentioned. After the 18th pain crises of considerable severity began to come in the arms. These members became progressively weaker until finally he was unable to move them and they had to be frequently lifted about on the pillows by the nurses. He was also frequently nauseated after the 18th, and vomited several times after the 20th. Bedsores were troublesome, occurring with slightest provocation.

During the evening of the 23rd it was noticed that his pulse was very bad at frequent intervals. He died suddenly and quietly at one o'clock A.M. on the 24th.

A post-mortem examination made a few hours after death showed that there had been a dislocation forward of the seventh vetebra. The supra-spinous ligament, which seemed to have been an unusually strong and well-defined structure in this instance, was snapped in two half way between the spines of the seventh cervical and first dorsal vertebræ. The fracture of it was abrupt, a break rather than a tear. Compared to this the violence to other ligaments and muscles seemed slight. The anterior common ligament was not entirely severed, but had been pushed forward and torn. It was in process of rapid repair by an inflammatory exudate. The dislocation was complete, both articular processes having slipped in front of their fellows of the first dorsal. There was no fracturing of either bone, only a slight grinding of the anterior edge of the body of the first dorsal.

The cord was evidently somewhat softened and attenuated at the site of compression. There was no bulging of the membranes above or below this point, and no hemorrhage or inflammatory exudation outside of them. They were not opened. The body had been filled with embalming fluid before the autopsy, and as there was little probability of a satisfactory microscopical examination, the specimen with the cord *in situ* was therefore preserved until all who were especially interested had had an opportunity to see it.

Dr. Robert J. Terry, Professor of Anatomy in Washington University, kindly studied with me the comparative liability of the seventh cervical vertebra to dislocation; and, for reasons which I will not stop here to enumerate, he thinks it more liable to an accident of this kind than any vertebra between the 2nd cervical and 10th dorsal. The spine of the 1st dorsal dropping as it does, leaves between it and the 7th cervical a relatively long span for the supra-spinous ligament, making it more liable to part at this point, especially during a strain from extreme flexion.

An X-ray examination was, unfortunately, impracticable. The surgeons in the case felt that they had been able to make an unusually thorough and satisfactory manipulation, and that inasmuch as two neurologists present thought a hematomyelia probable, an incision and exploration were not warrantable. The writer advocated an incision as the only means of obtaining positive information about the condition of the vertebræ at the site of the cord-lesion. The consultation at which these deliberations occurred was twenty hours after the accident, leaving in this case little reason why an incision should be insisted upon. Hence we simply "saved an exception," which is herewith recorded because it helps to impress an important lesson, namely, the difficulty of diagnosticating fractures and dislocations in any of the regions of the vertebral column, and the necessity of resorting to all possible means of investigation in order to establish a diagnosis.